What is claimed is:

1. A combination suitable for detecting damage in an object, said combination comprising fiber optic means and triboluminescent means each being adaptable to association with said object so that a mechanical event attendant said damage is capable of causing said triboluminescent means to emit light at least some of which is transmissible by said fiber optic means.

2. The combination according to claim 1, further comprising photosensitive means wherein, when at least some said emitted light is transmitted by said fiber optic means, said photosensitive means is capable of responding to said transmitted light so as to indicate the presence of at least some said transmitted light.

3. The combination according to claim 1, wherein:

said fiber optic means includes outer casing means and inner transmissive means;

at least a portion of said outer casing means is capable of allowing at least some said emitted light to pass therethrough so as to reach said inner transmissive means; and

said inner transmissive means is capable of transmitting at least some said emitted light which has passed through said outer casing means.

4. The combination according to claim 3, wherein:

said at least a portion of said outer casing means is at least two portions of said outer casing means; and

each said portion of said outer casing means is capable of allowing at least some said emitted light of a particular wavelength to pass therethrough; and

said particular wavelength differs for at least two said portions of said outer casing means.

5. The combination according to claim 1, wherein said fiber optic means includes open tip means, said open tip means being devoid of said outer casing means so as to allow at least some said emitted light to reach said inner transmissive means.

6. Damage-autosensitive apparatus comprising:

a structure;

at least one fiber optic line, each said fiber optic line being connectable to a photodetector and being situated so that a portion of said fiber optic line is in communication with said structure; and

at least one triboluminescent element, each said triboluminescent element being integrated with said structure and being sufficiently proximate a said fiber optic line so that, upon an occurrence of damage to said structure:

an accompanying mechanical action upon said triboluminescent element results in a luminescent emission of light by said triboluminescent element; and

at least a portion of said luminescently emitted light is transmissible to said photodetector via said fiber optic line.

7. Damage-autosensitive apparatus as recited in claim 6, wherein at least one fiber optic line is situated so that a portion of said fiber optic line is in communication with an external portion of said structure.

8. Damage-autosensitive apparatus as recited in claim 6, wherein at least one fiber optic line is situated so that a portion of said fiber optic line is in communication with an internal portion of said structure.

9. Damage-autosensitive apparatus as recited in claim 6, wherein at least one fiber optic line is situated so that a portion of said fiber optic line is at least one of the following:

in communication with an external portion of said structure;

in communication with an internal portion of said structure; and

in communication with both an external portion and an internal portion of said structure.

10. Damage-autosensitive apparatus as recited in claim 6, wherein:

said structure is an overall structure including a laminar composite structure having plural lamina; and

at least one said fiber optic line is situated so that a portion of said fiber optic line is positioned between two adjacent said lamina.

11. Damage-autosensitive apparatus as recited in claim 6, wherein:

said structure is an overall structure including a fiber-reinforced matrix composite structure having a matrix phase and plural fiber reinforcements situated in said matrix phase; and

at least one said fiber optic line is situated so that a portion of said fiber optic line is positioned within said matrix phase so as to function as a said fiber reinforcement.

12. Damage-autosensitive apparatus as recited in claim 6, wherein:

said structure is an overall structure including a matrix composite structure having a matrix phase and plural constituents situated in said matrix phase;

each said constituent is selected from the group consisting of fiber reinforcement, particle reinforcement and particle filler; and

at least some said triboluminescent elements are integrated with said matrix composite structure whereby each said triboluminescent element constitutes at least a part of a said constituent.

13. Damage-autosensitive apparatus as recited in claim 6, wherein said triboluminescent elements are integrated with said structure so that at least one of the following sets of conditions obtains:

(a) at least one said fiber optic line is situated so that a portion of said fiber optic line is in communication with an external portion of said structure, and at least some

said triboluminescent elements are sufficiently proximate said fiber optic portion communicating with said external structure portion;

(b) at least one said fiber optic line is situated so that a portion of said fiber optic line is in communication with an internal portion of said structure, and at least some said triboluminescent elements are sufficiently proximate said fiber optic portion communicating with said internal structure portion; and

(c) at least one said fiber optic line is situated so that a first portion of said fiber optic line is in communication with an external portion of said structure and so that a second portion of said fiber optic line is in communication with an internal portion of said structure, at least some said triboluminescent elements are sufficiently proximate said first fiber optic portion communicating with said external structure portion, and at least some said triboluminescent elements are sufficiently proximate said second fiber optic portion communicating with said internal structure portion.

14. Damage-autosensitive apparatus as recited in claim 6, wherein:

at least a section of each said fiber optic line portion communicating with said structure is permeable to light; and

at least a portion of said luminescently emitted light sufficiently permeates at least one said light-permeable section so that at least a portion of said permeated luminescently emitted light is transmissible to said photodetector.

15. Damage-autosensitive apparatus as recited in claim 14, wherein:

at least two sections of each said fiber optic line portion communicating with said structure are permeable to light;

each said light-permeable section is permeable to light characterized by a different wavelength.

16. Damage-autosensitive apparatus as recited in claim 14, wherein each said light-permeable section is one of:

a longitudinal section of the corresponding said fiber optic line portion; and

an end section of the corresponding said fiber optic line portion.

17. Damage-autosensitive apparatus as recited in claim 14, wherein said photodetector is producible of an indication of at least a portion of said transmitted permeated luminescently emitted light.

18. Damage-autosensitive apparatus as recited in claim 14, wherein:

each said fiber optic line includes an outer coaxial fiber optic portion and an inner coaxial fiber optic portion;

at least a portion of said luminescently emitted light is transmissible to said photodetector via said inner coaxial fiber optic portion; and

at least a portion of said luminescently emitted light sufficiently permeates said outer coaxial fiber optic portion of at least one said light-permeable section.

19. Damage-autosensitive apparatus as recited in claim 6, further comprising said photodetector, each said fiber optic line being connected to said photodetector, wherein, upon said occurrence of damage to said structure:

at least a portion of said luminescently emitted light is transmitted to said photodetector via said fiber optic line; and

said photodetector produces an indication of at least a portion of said transmitted permeated luminescently emitted light.

20. Damage-autosensitive apparatus as recited in claim 19, wherein:

each said fiber optic line includes an outer coaxial fiber optic portion and an inner coaxial fiber optic portion;

upon said occurrence of damage to said structure, at least a portion of said luminescently emitted light is transmitted to said photodetector via said inner coaxial fiber optic portion; and

at least a portion of said luminescently emitted light sufficiently permeates said outer coaxial fiber optic portion of at least one said light-permeable section.

21. A method for sensing mechanical damage, said method comprising:

triboluminescently radiating light in response to said damage; and

fiber optically conveying at least some said triboluminescently radiated light so as be informative about said mechanical damage.

22. A method of sensing the damage condition of an object, said method comprising:

integrating triboluminescent material with said object; and

associating at least one fiber optic line with said object and with a photosensitive device so that, following a damage-causing event acompanied by a mechanical action upon at least some said integrated triboluminescent material, a quantity of a resultant triboluminescent light emanation is transmitted by at least one said fiber optic line to said photosensitive device.

23. A method as defined in claim 22, wherein following said damage-causing event accompanied by said mechanical action:

said quantity of said resultant triboluminescent light emanation is a second quantity of said resultant triboluminescent light emanation;

prior to said transmitting, a first quantity of said resultant triboluminescent light emanation is admitted by at least one said fiber optic line;

said resultant triboluminescent light emanation includes said first quantity of said resultant triboluminescent light emanation;

said first quantity of said resultant triboluminescent light emanation includes said second quantity of said resultant triboluminescent light emanation.

24. A method as defined in claim 23, said method further comprising providing at least one said fiber optic line, wherein:

said fiber optic line has an exterior membrane and an interior light-transmissive path; and

said exterior membrane is at least partially light-admissible along at least a portion of the length of said fiber optic line, said fiber optic line thereby being admissible of said first quantity of said resultant triboluminescent light.

25. A method as defined in claim 23, said method further comprising providing at least one said fiber optic line, wherein said fiber optic line is at least partially light-admissible at an extremity of said fiber optic line, said fiber optic line thereby being admissible of said first quantity of said resultant triboluminescent light.

26. A method as defined in claim 23, wherein at least one said fiber optic line is suitably distanced from said at least some triboluminescent material so as to be admissible of said first quantity of said resultant triboluminescent light.

27. A method as defined in claim 23, wherein following said damage-causing event accompanied by said mechanical action:

subsequent to said transmitting, a third quantity of said resultant triboluminescent light emanation is received by said fiber optic line; and

said second quantity of said resultant triboluminescent light emanation includes said third quantity of said resultant triboluminescent light emanation.

28. A method as defined in claim 27, wherein said associating of at least one said fiber optic line with said photosensitive device is performed so that said photosensitive device is capable of being indicative of said third quantity of said resultant triboluminescent light emanation.

29. A method as defined in claim 28, said method further comprising providing said photosensitive device, wherein said photosensitive device is capable of repeatedly receiving a said third quantity of a said resultant triboluminescent light emanation, said photosensitive device thereby being capable of monitoring said damage condition of said object.

30. A method as defined in claim 22, wherein at least one of the following obtains:

said integrating triboluminescent material with said object includes selecting at least one location at which said object is susceptible to damage; and

said associating of said at least one fiber optic line with said photosensitive device includes selecting at least one location at which said object is susceptible to damage.

31. A method as defined in claim 22, wherein:

said method further comprises providing at least one said fiber optic line;

said at least one fiber optic line includes at least two fiber optic line portions which are at least partially light-admissible;

each said fiber optic line portion is admissible only to light of a corresponding wavelength; and

at least two said corresponding wavelengths are different.